GPO 16—67244-1

A

DISSERTATION

ON THE

SOURCES

OF

Malignant Bilious, or Yellow Fever,

AND MEANS OF PREVENTING IT:

SUBMITTED TO

THE EXAMINATION

OF THE

REV. JOHN EWING, S. T. P. PROVOST;

THE

TRUSTEES & MEDICAL FACULTY,

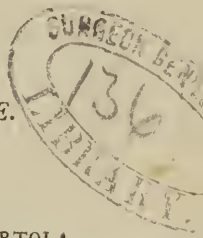
OF THE

UNIVERSITY OF PENNSYLVANIA,

On the sixth Day of June, 1799,

FOR THE DEGREE OF

DOCTOR OF MEDICINE.



BY WILLIAM G. CHALWILL, OF TORTOLA,

MEMBER OF THE PHILADELPHIA MEDICAL AND CHEMICAL SOCIETIES.

PHILADELPHIA:

PRINTED BY WAY & GROFF,

No. 48, North Third-Street.

1799.

TO

PHILIP SYNG PHYSICK, M. D.

THIS DISSERTATION

IS DEDICATED,

AS A TESTIMONY OF THE

SINCERE FRIENDSHIP,

AND GRATITUDE,

OF HIS FORMER PUPIL,

W. G. CHALWILL.

For

Dr. J. R. Coxe

with the best wishes

of his friend

The author

DISSERTATION, &c.

BEFORE we enter on the immediate conſideration of the ſubject of this diſſertation, it may not be improper to introduce a few general remarks, which appear neceſſary, in order to be underſtood in ſome opinions which will be delivered therein.

Fever, from whatever cauſe it may proceed, I conceive to be the ſame. This can be more clearly comprehended, from the definition given of it, by Dr. Ruſh, the profeſſor of the inſtitutes of medicine, in the Univerſity of Pennſylvania. He defines it to conſiſt of, irregular, morbid, or convulſive action, in the blood-veſſels. It is no objection to this definition, that in ſome fevers, there occurs a defect of action, as this defect is certainly morbid.

There is but one remote cauſe of fever, and that is ſtimulus. This we conclude, from many ſubſtances, ſuch for inſtance as opium, ſpirituous liquors, &c. which are univerſally acknowledged to be ſtimulant, and many others, from the animal, vegetable, and mineral kingdoms, by their external

or internal action on the body, producing genuine fever. Like the exhibition of these violent poisons in excessive quantities, in prostrating the system below the point of re-action, the remote causes of malignant epidemic diseases, have produced similar effects, and like them, in some instances, almost immediate death. In the plague, and yellow fever, this has been particularly noticed by different writers. During the prevalence of those diseases, instances have frequently occurred, of persons dying within a very few hours, after having been attacked; and have experienced little or no inconvenience, until a very short time previous to their death.

Having delivered these observations, we shall proceed with our inquiry into the sources of malignant, bilious, or yellow fever.

The opinions, which have been entertained on this, as on every other point, in, and connected with, medicine, have been as various, as plausibility or improbability, could give scope for. The examination of the variety of opinions, which prevail, even at the present day, would far exceed the limits prescribed for a thesis, and could not be attended with any evident advantage.

The generality of physicians, however, agree in supposing, that the effluvia or miasmata, arising

from putrefying animal and vegetable ſubſtances, are the cauſe of this diſeaſe. This opinion we ſhall adopt, in the ſucceeding pages. It would be proper in this place to ſpeak of the nature of theſe effluvia, but it will be readily perceived, that on this ſubject we can ſay nothing, with certainty, as the preſent ſtate of ſcience affords us no means, by which we may detect their preſence or determine their qualities. It is even a diſputed point, whether during the prevalence of epidemics, there is an addition of ſome peculiar matters, or a deficiency or exceſs, in the natural component parts of the atmoſphere. We can therefore only judge of them, by their effects.

There are, however, three facts which have been noticed, with reſpect to epidemics, which are worthy of our attention.

I. That the inflammatory conſtitution of the air, which diſpoſes to them, extends its influence over conſiderable portions of our globe at one and the ſame time. While the yellow fever was epidemic, in many parts of the United States, during the years 1793 and 1794, it was at the ſame time epidemic in moſt of the Weſt Indian iſlands. The diſeaſes which occurred at ſea, during thoſe years, were obſerved to aſſume a higher grade of action. From this we may conclude, that the ſurface of the ocean itſelf, was

not exempted from its influence. Thucydides tells us in his account of the plague at Athens, that it prevailed at the ſame time in part of Ethiopia, in Egypt, in Lybia, and over a conſiderable extent of the Perſian dominions. Procopius and Evagrius tell us that the plague which broke out at Conſtantinople, during the reign of the Emperor Juſtinian, laſted fifty-two years, and ſpread its influence over the whole earth.

II. That it continues many years under every viciſſitude of weather.

III. That during its continuance, it cauſes all other diſeaſes to aſſume a more inflammatory grade of action, and hence we derive the propriety of ſaying, *the reigning epidemic.*

In ſupport of the two laſt mentioned facts, we may aſſert, that the diſeaſes of the United States, have been uniformly obſerved to be more violent, ſince the general epidemic of 1793. This has been evinced by their requiring the reſpective modes of treatment for curing each of them, to be uſed more extenſively, to prove effectual, than they did previous to that period.

Since, therefore, we know ſo little of the nature of the cauſes, or rather miaſmata, we muſt

content ourſelves with an inveſtigation of the ſources from whence malignant bilious, or yellow fever ariſes; and in this we can probably proceed, with ſome degree of certainty.

We ſhall commence with thoſe ſources which operate moſt extenſively, and proceed with thoſe which have been more confined in their influence. The ſources which preſent themſelves for our attention, are,

I. Marſhy and ſwampy grounds, ſtagnating ponds and low lands, which have been overflowed with water, and in which have been depoſited, ſubſtances proper for putrefaction, from the influence of the heat of the ſun. To prove that theſe ſources do produce the cauſes of yellow fever, it is only neceſſary that we ſhould attend to a few well authenticated facts.

It is a remark, ſanctioned by univerſal experience, that low countries and lowland ſituations, are always unhealthy, provided they abound with marſhes. Dr. Lind, among his ſigns of an unhealthy country, places a ſwampy ſoil as the firſt, and moſt certain.

The province of Guiana, remarkable for its low ſituation and ſwampy ſoil, continued to prove a

grave to thoſe who went to ſettle there, until means were taken to render it healthy, which will be mentioned hereafter.

It may not be improper to remark in this place, that a certain concentration of the marſh miaſmata, appears neceſſary, to produce yellow fever. Where this concentration does not take place, the effluvia produce fevers of an inferior grade. We conclude this, from the higher and lower grades of fever, proving alternately epidemic in the ſame ſituations; the higher grade prevailing in thoſe ſeaſons, moſt favourable for a copious evolution of the miaſmata.

The circumſtances under which the yellow fever has appeared in many inland parts of the United States, afford us ample proof of its originating from the effluvia of marſhes; and as ſuch facts are more intereſting to us at preſent, we ſhall confine ourſelves to them.

As it is directly to our purpoſe, I muſt here take the liberty of tranſcribing a document *, from among thoſe accompanying two letters addreſſed to the governor of Pennſylvania, by the academy of medicine of Philadelphia.

* See appendix to thoſe letters, (Document C.)

" I do hereby certify, that I viſited the farms at and in the vicinity of Red-bank, ſituate on the eaſtern ſhore of the Delaware, for the purpoſe of inveſtigating the origin of the yellow fever, that raged ſo violently amongſt them, during the late autumn. I ſought every poſſible information from the attending phyſician, the families who had been attacked, and from their neighbours. Knowing that a diſeaſe of this kind might have been derived from domeſtic ſources, from the city of Philadelphia, and, poſſibly, from the ſhipping performing quarantine, I was exceedingly particular upon theſe points of enquiry and inveſtigation. After examining the documents upon this ſubject, I do not heſitate to pronounce it the offspring of local cauſes.

" The moſt valuable part of theſe farms conſiſts in meadows, which had been overflowed, for ten or twelve days, by a deluge of rain that commenced on the firſt of Auguſt. The waters gradually diſappeared, and depoſited a ſcum that was exceedingly nauſeous. The roots of the graſs were dead in many places for an acre or more in extent; even ſix inches below the ſurface of the earth they were deſtroyed—the vegetable putrefaction was great, and the ſmell ariſing from it extremely diſagreeable. To this ſource I attribute the diſeaſe that prevailed amongſt them. Twenty-nine perſons were attacked in five families; but ſo local was the calamity, that,

although the neighbours kept up a conſtant communication, by viſiting the ſick rooms, and rendering their ſervices, no perſon, that theſe families recollect, was affected with it, in conſequence. And there is but one poſſible caſe in which it could have been communicated, by any one of theſe families to any of the others.

" My opinion of the local origin of the yellow fever, derives ſupport from its being the idea of the phyſician who attended the ſick, and the univerſal ſentiment of thoſe who have ſuffered by it. Documents, entering into detail, to eſtabliſh theſe, and a variety of other points connected with the diſeaſe, are ſubſcribed by all the perſons alluded to, and depoſited among the records of the academy of medicine.

Signed, JOHN C. OTTO.

March 20th, 1798."

At Sheffield, in the ſtate of Maſſachuſetts, a violent bilious fever has prevailed, ſeveral ſucceſſive years, which appears to have had a ſtrong alliance to yellow fever, from the account given of it by Dr. Buel. In this account, the author, after ſtating his facts, relative to the diſeaſe, has the following words: " That the ſtagnant waters in Sheffield, and the ſickneſs which prevailed there in 1796, and the other late ſickly years, ſtand in the relation of

cauſe and effect, is, I think, a poſition which no perſon capable of reaſoning, can withhold his aſſent to, after admitting, and candidly conſidering, the facts which I have ſtated."

In the village of Kenſington, about two miles diſtant from the city of Philadelphia, ſeveral caſes of yellow fever occurred, in the autumn of 1797, which appear to have been derived from marſh effluvia. This little place is ſurrounded on all ſides by marſhy grounds, which are filled with putrefying, dead vegetable ſubſtances.

At Lamberton, on the eaſtern bank of the river Delaware, near Trenton, ſeveral caſes of yellow fever occurred, in the autumn of 1798. The inhabitants endeavoured to trace them from contagion, conveyed by perſons from Philadelphia. Having had an opportunity of examining whether any foundation exiſted for ſuch a ſuppoſition, I found none. But on inveſtigation, there appeared evident reaſon for believing, that they were produced by a conſiderable extent of marſhy ground, containing a great deal of ſtagnating water, and putrefying vegetable ſubſtances, that lay in a ſouthern direction from Lamberton, diſtant about a quarter of a mile.

That portion of land, ſituate at the conflux of

the rivers Delaware and Schuylkill, known by the name of the neck, containing a large tract of marſhy ground, affords us a very good proof of the origin of violent bilious fever from exhalation. Scarce an autumn paſſes, but what numbers of the inhabitants are affected with fevers, ſhewing ſtrong marks of an approach to the malignant type.

II. From putrefying animal and vegetable ſubſtances depoſited in gutters, filthy alleys, in docks, on wharves, in public ſinks, &c.

We have too much reaſon to ſuppoſe, that theſe were the principal ſources, of the yellow fever, which has, at different times, deſolated the cities of Philadelphia and New York. That theſe ſources have operated very ſtrongly in producing the diſeaſe, we infer from the obſervations of many reſpectable phyſicians, all of which agree, that in the vicinity of ſuch places, as above enumerated, the fever began, and raged with more violence, than, in thoſe ſituations, which were remote from their direct influence. Several caſes, derived from theſe ſources, are mentioned in the firſt letter of the academy of medicine of Philadelphia, addreſſed to the governor of Pennſylvania, on the authorities of Doctors Ruſh, Phyſick, Caldwell, and Paſcalis.

Dr. Seaman, in his ingenious inquiry into the

cauſe of the prevalence of the yellow fever in New York, publiſhed in the medical repoſitory, has given pretty decided proof, of its originating from theſe ſources. As certain parts of this inquiry are directly to our purpoſe, I hope I ſhall be excuſed for tranſcribing thoſe which are the moſt intereſting.

" In the autumn of 1791, the yellow fever was conſiderably prevalent in a part of Water-ſtreet, in the neighbourhood of Peck's-ſlip, noted, at that time, for having the docks near to it, loaded with every kind of filth that could be ſcraped up out of the adjoining ſlips, which had been long collecting every ſpecies of corruptible materials, that the citizens wiſhed to get rid of.

" In 1795, that part of the town, that bore the chief burthen of our calamity, was remarkably diſtinguiſhed, by peculiarity of circumſtances and ſituation (aided by the ſingular regularity of our rains), ſeemingly well calculated for the accumulation and decompoſition of all kinds of periſhable animal and vegetable ſubſtances.

" The chief prevalence of the diſeaſe, in 1796, ſeemed evidently fixed, where, from our former experience, we ought reaſonably to have expected it. For no doubt, at that time, the neighbourhood of the Whitehall, from the nature of materials,

wherewith a large dock was there filling up, aided by the noiſome exhalations, from the expoſed bottom of the Exchange-ſhip at low-water, muſt certainly have been rendered the moſt noxious part of the city. Four deaths from the yellow fever occurred, during that ſeaſon, within fifty yards of where Rooſevelt-ſtreet drain empties itſelf into an inlet, which was then open quite up to the ſoutherly ſide of Water-ſtreet; the bottom of which was frequently, in part, left bare, even at high water. Every ebb-tide expoſed, at leaſt, eight hundred ſquare yards of its ſurface, covered with the numerous periſhable materials, furniſhed by the different ſtreets, of that crowded part of the town, which deſcend into this common ſewer, in addition to the other putrid matters, that ſuch handy places are always collecting."

The yellow fever was generated in the year 1762, near the draw bridge, in Philadelphia, by the noxious effluvia, ariſing from putreſcent matters, collected from all parts of the city, in a well known receptacle, at that place.

The following communication, from Dr. George Davidſon, of the iſland of St. Vincents, to Dr. Ruſh, decidedly ſhews, the origin of yellow fever, to be from the effluvia diſcharged from putrefying animal and vegetable ſubſtances.

" The yellow fever is evidently produced by a peculiar ſtate of the air, and by marſh exhalations. The ſituation of thoſe habitations where it firſt appears, near to ſtagnant water, or ſwamps, point out this to be its origin. The governor's guard on this iſland was ſtationed in an old bathing houſe. The ſtream of water which had run through it, had been diverted from it; but a quantity of mud and filth, had been allowed to accumulate in a watering trough near the door; in conſequence of which, ſeveral of the guards were ſeized with the uſual ſymptoms of yellow fever. Above ten died before the cauſe was diſcovered, and immediately upon removing it (the filth collected in the watering trough) the guard became healthy."

Many ſources of inferior note, have at different times given riſe to ~~malignant~~ yellow fever, the moſt important of which we ſhall now proceed to mention.

1. The noxious air diſcharged from putrefying animal and vegetable ſubſtances, contained in the holds of ſhips. A conſiderable ſource of the yellow fever, which raged in the ſouth-eaſtern part of Philadelphia, in the year 1797, was attributed to the foul air emitted from the ſnow Huldah, from Hamburgh, and ſhip Navigation from Marſeilles, from ſome of the materials which compoſed their

cargoes, putrefying in their holds, during their voyages.

The crews of theſe veſſels continued healthy, from their leaving the ports from whence they came until they diſcharged their cargoes, at the wharves in this city, when ſeveral of their crews, and many reſidents near thoſe wharves were immediately ſeized with the fever.

At Tortola, a fever was produced in the month of June, in the year 1787, on board the ſhip Britannia, Capt. James Welch, from the noxious air generated from a few buſhels of potatoes, which deſtroyed the captain, mate, and moſt of the crew, in a few days.

Two ſailors were affected with a malignant fever on board the ſhip ——, Capt. Thomas Edgar, in the month of March, 1797, from the noxious air produced by wine that had putrefied in the hold of the ſhip, one of whom died, ſoon after her arrival at Philadelphia.

In the month of June, 1793, the yellow fever was generated by the noxious air, emanating from ſome rotted bags of pepper, on board a French Indiaman, which was carried in the port of Bridgetown in Barbadoes, by the Britiſh letter of marque Pil-

grim. All the white, and moſt of the black men employed to remove this pepper, periſhed with yellow fever, and the foul air affected the town, where it deſtroyed numbers of the inhabitants.

A yellow fever was produced on board the Buſhbridge Indiaman, on her paſſage from England to Madraſs, in the month of May, 1792, which affected above two hundred of her crew, by putrefying materials confined in her hold.

Inſtances of yellow fever, originating from ~~tropical~~ casual ſources, have occurred in every country and ſituation. As they tend to prove that the diſeaſe is produced by the effluvia, of animal and vegetable ſubſtances, during their decompoſition, I ſhall briefly enumerate them, as mentioned by ſuch authors, as I have peruſed for information, on this ſubject.

1. Cabbage. 2. Potatoes. 3. Pepper. 4. Indian meal. 5. Onions. 6. Mint. 7. Aniſe and caraway ſeed confined in the hold of a ſhip.

8. Putrefying coffee. The firſt caſes of yellow fever which occurred in the month of Auguſt, in the year 1793, in this city, aroſe from this ſource.

Dr. Trotter mentions, on the authority of the

captain of a man of war, that the whole crews of ſeveral veſſels, in the holds of which, great quantities of this article had been allowed to putrefy, were found dead on their decks, from the immediate action of air diſcharged on opening their hatches.

9. Cotton that had been wetted on board of a veſſel, that arrived a few years ago from Savannah, in Georgia, at New York.

10. Hemp, flax, and ſtraw.

Dr. Zimmerman relates the fact, of a family that were affected with a malignant fever, generated by a few pounds of putrefying flax.

11. The canvaſs of an old tent.

12. Old books, and old paper money, that had been wetted and confined in cloſe rooms and cloſets.

13. The timber of an old houſe.

14. Green wood confined in a cloſe cellar, during the ſummer months.

15. The green timber of a new ſhip.

16. The ſtagnating air of the hold of a ſhip.

17. Bilge water.

18. The ſtagnating air of cloſe cellars.

19. Air emitted by agitating foul and ſtagnating water.

20. A duck-pond.

21. A Hog-ſtye.

All theſe different ſources have been mentioned by authors as having given riſe to malignant fevers.

Animal ſubſtances, I believe, ſeldom produce this grade of fever, when acting alone, although the following facts, ſhew that it has been in a few inſtances produced from this ſource.

1. Dr. Oſborne has (through the medium of the New York medical repoſitory) communicated the caſe of a ſoldier, who had a malignant fever brought on by the miaſmata ariſing from putrefying beef.

2. Locuſts.

3. A whale thrown on the ſea ſhore in Holland.

4. Human bodies which have putrefied on a field of battle.

5. Raw hides confined in ſtores and in the hold of a ſhip.

6. Dead fiſh putrefying on the ſhores of the ſea and of rivers.

The unhealthineſs of a place called Gambroon, mentioned by Mr. Ives in his travels from India to Europe, over land, is imputed to the quantities of blubber fiſh, left annually, during the ſummer months, by the ſea upon the ſhore, which very ſoon become highly putrid, and offenſive.

The ſame gentleman tells us, that the Arabs, as a reſentment for the injuries they had ſuſtained from the Turks of Baſſora, broke down the banks of the river Tigris, which overflowed the environs of that great city, and from the depoſition of dead fiſh, a malignant fever was produced which deſtroyed 14,000 of its inhabitants.

Theſe facts, we hope are ſufficient to prove, that the malignant yellow fever, is the offspring of animal and vegetable putrefaction.

The influence of the extremes of heat and cold, on the cauſes of this diſeaſe, are pretty nearly the ſame, for they both deſtroy them. This is to be admitted with proper limitations. Cold weather

does it effectually, and exceſſive hot weather in ſome degree. Moiſture, heat, and dryneſs of the atmoſphere, alternating with each other, appear to be moſt favourable for their formation, and a chilline ſs in the air ſucceeding theſe, the moſt effectual means, of bringing them into action. This ſuggeſts to us the propriety of accommodating our dreſs to the changes of the atmoſphere, to prevent the miaſmata from acting on our ſyſtems; the change from a higher, to a lower temperature of air, rendering them more ſuſceptible of morbid actions, from an increaſe of excitability.

There are many other ſtimuli, which, by their action on the body, produce moſt of the ſymptoms of malignant fever. To examine all of them would far exceed the limits of this diſſertation. We may however juſt enumerate ſome of them.

1. Opium.

2. Poiſon of a mad dog.

3. The poiſon of the viper.

4. Variolus infection.

5. Many poiſonous vegetables.

6. Hydrogene gas. This fluid has been long

conſidered inert, and depriving animals of life, merely by a negative action, in preventing the acceſs of oxygenous gas to their lungs. Dr. Woodhouſe having inhaled a conſiderable quantity of this air, to convince the medical claſs of its innocence, was in conſequence of it, ſeized with a highly inflammatory fever, which yielded only to copious depletion.

7. The poiſons of certain ſpiders, and of the ſcorpion.

8. Arſenic.

9. Certain concentrated mineral acids, and metallic ſalts, taken into the ſtomach in large quantities.

10. The action of fire.

From the view we have taken, of the ſources of malignant yellow fever, it is evident, they may exiſt in any part of the world. This being admitted, it neceſſarily follows, that it is the height of abſurdity, to aſſign it excluſively to any place. This erroneous idea, muſt have taken its riſe, from the diſeaſe being more frequently prevalent in certain countries, favoured by the ſtates of air, moſt proper for the evolution of marſh miaſmata.

The cauſes of yellow fever operate in a variety of ways, producing,

1. Dyſentery. As an inſtance of this, we may juſt mention the Duke of Brunſwick's army, in entering the French dominions, in the autumn of 1792. This great army, conſiſting of near 100,000 men, being arreſted in their progreſs on the marſhy plains of Champagne, were obliged, from the prevalence of this diſeaſe among them, to retreat, in leſs than two months.

2. Hepatitis.

3. Colic.

4. Colera.

5. Cutaneous eruptions.

6. Leproſy.

7. Scurvy. Dr. Claiborne, in his inaugural theſis, laſt year, on the ſcurvy, does not heſitate to place marſh effluvia, the firſt on his liſt of the remote cauſes of this diſeaſe.

8. Ophthalmia.

Having finiſhed our inquiry into the ſources, we ſhall proceed to the next part of this diſſertation, viz.

MEANS OF PREVENTION.

This may with propriety be divided into two parts.

1. As it reſpects the cauſes, and 2dly, as it reſpects the body.

As we conſidered marſhy grounds, &c. firſt, when treating of the ſources, we ſhall treat of them firſt in this place.

The only plan we can recommend to prevent theſe extenſive ſources of yellow fever, is to cultivate ſuch grounds, where it is practicable. All countries have been obſerved to enjoy a greater degree of health, in proportion to cultivation.—Where this cannot be practiſed, draining by means of canals, has proved very effectual.

The now fertile province of Demarara, at one time almoſt uninhabitable from its unhealthineſs, has by this means been rendered as healthy as moſt tropical countries.

If marſhy grounds or filthy ſtagnating ponds, cannot be cultivated or drained, we recommend the planting of trees around them. They may act in two ways, 1. By mechanically diffuſing the miaſ-

mata through the atmoſphere, and thereby preventing a ſufficient concentration of them to produce diſeaſe, and 2dly, By giving out a large portion of oxygenous gaz, and thereby purifying the vitiated atmoſpheric air. The willow tree appears beſt calculated for this purpoſe, as being quickeſt in growth, and yielding a greater quantity of pure air.

With reſpect to putrefying animal and vegetable ſubſtances, collected from negligence, we can do nothing more than recommend their removal. It would be worthy the inveſtigation of ſome ingenious perſon, to form a plan, for doing this with œconomy, as the expenſe attending their removal, would be far too great, to have it done properly. It is probable this might be done, by eſtabliſhing a plan for the formation of artificial nitre beds from theſe materials, that would repay the expenſe of removing them, by the nitre, which they would produce.

This may alſo be done by means of water. To be effectual, it ought to be furniſhed in ſufficiency, to deluge the ſtreets, whenever occaſion may require. Or it may be done by paſſing a canal of water through the ſtreets, and ſweeping the ſubſtances in a ſtate of putrefaction into it, that may be conveyed to the river into which the canal may empty itſelf.

The eſtabliſhment of quarantine laws, and of lazarettoes would effectually prevent the production of yellow fever from the damaged cargoes of veſſels.

Two methods have been found uſeful in deſtroying the miaſmata.

1. By nitrous fumigations. This has been highly recommended by Dr. Carmichael Smyth, and is now generally adopted throughout the Britiſh Navy, where it has been found very effectual.

2. Smoke. Dr. Lind, in his eſſay on the diſeaſes incident to Europeans in hot climates, relates the fact of two men of war which were cruiſing in company, on the coaſt of Guinea, on board of one, the crew were very ſickly, and many died, the crew of the other remained perfectly healthy. Upon examination, it appeared from the conſtruction of theſe different ſhips, that in the one, which had the healthy crew, the ſmoke of the cook's room uſed to ſpread itſelf over the whole ſhip's decks, and between them; while in the other, it flew directly off from the veſſel, with the wind.

The means of prevention as they reſpect the body, are,

1. By reducing the ſyſtem as in preparing the

body for the ſmall pox. This may be done, 1. By a vegetable diet, or a diet of ſalt meat, which affords leſs nutrition than freſh, at the ſame time that it keeps up a more uniform degree of excitement.

2. By blood-letting. 3. Purges.

The following fact will ſhew the good effects of this plan of prevention, communicated by Dr. Borland to Dr. Ruſh.

In the month of Auguſt, 1797, 109 Dutch artilleriſts arrived at Port-au-Prince, in the Bangalore tranſport. The crew of this ſhip conſiſted of twenty-eight men. It was adviſed by Doctors Borland and Jackſon, that the whole detachment ſhould be bled and purged freely. The ſurgeon of the regiment, to which this company belonged, complied with their advice, which was accordingly executed. At the period of four months after, when this communication was made, only two men out of this detachment had died; of the crew only fourteen were living.

2. By eating often, even during the night, which by keeping up an equal degree of excitement, will render the ſyſtem leſs liable to be acted on, from prediſpoſing debility.

3. Cleanlineſs.

4. Warm bath.

5. Cheerful ſociety.

6. Conſtant occupation of mind and body. People, who were left in Philadelphia, to take care of houſes, during the prevalence of the yellow fever, and who were idle, were very liable to be affected by it.

7. Gentle exerciſe.

8. The internal and external uſe of ſweet oil. Mr. Baldwin the Engliſh conſul at Alexandria, informed Leopold count Berchtold, that he never heard of a ſingle oil porter having died with the plague. From this the count concluded, that olive oil muſt poſſeſs ſtrong prophylactic virtues. He tried it in twenty-two Venetian ſailors, all of which eſcaped the plague. From this we may rationally infer, that its effects would be ſimilar in the yellow fever.

9. A bliſter. Dr. Gallagher informed me, that during the prevalence of the yellow fever, in Philadelphia, laſt year, he applied bliſters to his wriſts, which he kept continually running, and to this aſcribes his eſcaping the diſeaſe.

10. An iſſue. Dr. Hodges tells us, that during the plague in London, he had a ſeaton in one of his legs, which gave him great pain every time he was expoſed to the contagion in viſiting his patients. It is probable that the pain was cauſed by a determination of morbid action to this artificial weak part.

It is an unfortunate fact, that the generality of mankind are blind to conviction, wherever truth and intereſt oppoſe each other. In yellow fever this is particularly the caſe. Notwithſtanding the numerous, decided proofs, brought forward by men and literary bodies, of the firſt eminence, of the domeſtic origin of this diſeaſe, yet there are not wanting many who believe, it owes its origin to importation. But as the preſent progreſſive and diffuſive ſtate of ſcience, is highly unfavourable to the continuance of error; the friends of truth, muſt look forward to a period, which I hope is not far diſtant, when, from the general adoption of their principles, the inhabitants of ſickly cities, and country ſituations, will, by their exertions, prevent the recurrence of theſe diſeaſes, by a removal of their cauſes.

FINIS.